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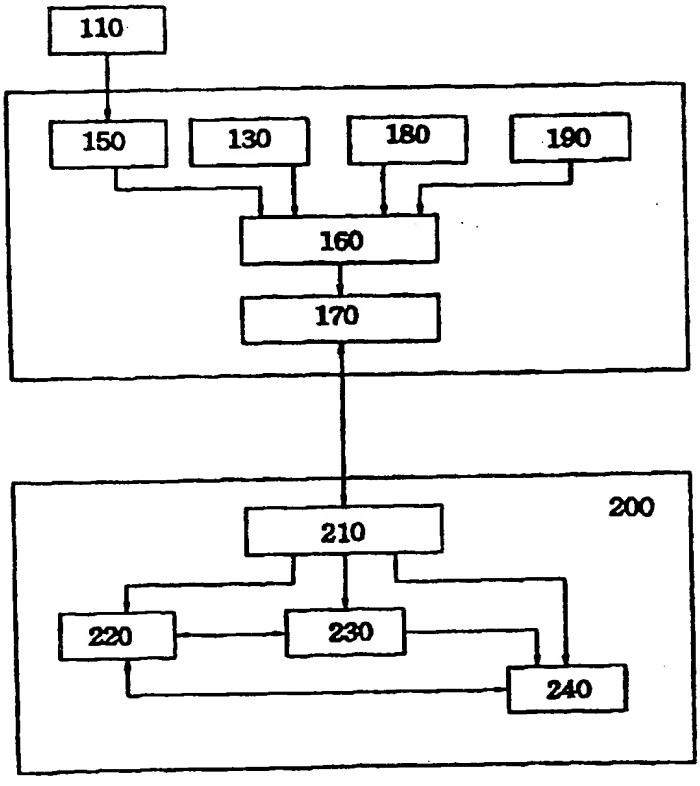
(54) Title: DATA INPUT DEVICE AND METHOD, AND COMPUTER SYSTEM USING THE SAME AND METHOD FOR RUNNING PROGRAM OF COMPUTER SYSTEM

(57) Abstract

The present invention is related to a data input device (100) for providing data to run an application program of the computer system and a data input method using the same. In addition, the present invention is related to a computer system having the data input device and a method for running the application program (240) of the computer system. The data input device of the present comprises a function card (110) on which functions of the application program and how to use the functions are expressed; a card holder for holding the function card; input means (180) for selecting the functions of the function card or inputting data; a mouse plate (130) for supporting the function card and sensing position of the input means; code sensing part (150) for sensing insertion or extraction and identification number of the function card; data processing part (160) for receiving data from at least one of the code sensing parts, the input means and the mouse plate, and interpreting the data; and, data transmitting part (170) for transmitting the interpreted data by the data processing part to the computer system (200).



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DATA INPUT DEVICE AND METHOD, AND COMPUTER SYSTEM USING THE SAME AND METHOD FOR RUNNING PROGRAM OF COMPUTER SYSTEM

Technical Field

The present invention is related to a data input device and a method, which make it possible to easily run a program and select its functions in a computer system. Also, the present invention is related to a computer system having the data input device and a method for running the program in the computer system.

Background Art

Conventionally, a program is executed when function menu that is displayed on a monitor is sequentially selected through a mouse or a keyboard. Also, if a program is related to graphic or education, it may be run by using a pointing type input device.

However, if a user uses a certain program for the first time or does not use it often, it is not easy for him to understand all the functions in the program and fully utilize it. Thus, he usually needs a help from a skilled person. Also, if a user is an illiterate child, he cannot select the functions that are displayed on the monitor. Therefore, he cannot run the program without help from other persons such as his parent.

Also, whenever a program is used, there are cases that many complex steps need to be repeated or only some parts of the functions may be used. Also, when a user error frequently occurs, it is necessary either to buy expensive equipment for the correction of such error or to adjust the entire computer system again.

In order to solve the above problems, a function card, which is specially manufactured, has been conventionally used. The function card is a relatively expensive one, because it is a magnetic recognition card or includes an integrated circuit. Also, a recognition device for the function card is too expensive for general users. Thus, there is a restriction in providing the user to various programs.

In addition, the function card is generally manufactured and provided by the maker of computer for children. It is not usually possible for the user to make the card that contains the functions he needs.

In addition, the conventional computers for children younger than school age use their own operating systems in consideration of the children who are usually illiterate. It requires a user to buy the computer for children even though the user has a computer, due to the incompatible operating systems.

Summary of Invention

In order to solve the above-mentioned problems in the prior art, the present invention provides a data input device and a method, which enable both a computer beginner and children to easily and simply run a program in a computer system.

It is an object of the present invention to provide a data input device and a method for carrying out the desired functions easily and simply without referring to a help menu, by expressing on the function card how to use the functions of a program as drawings and help messages.

It is another object of the present invention to provide a data input device and a method for running the program and its functions easily and simply by using the function card. A user can manufacture the function card by himself, if necessary, because it is formed on a printable material such as paper or plastic, which is inexpensive and easy to obtain.

It is another object of the present invention to provide a data input device and a method, wherein a code of the function card can be recognized by a code sensing process. In the code sensing process, plural codes on the function card are sensed by using a few sensors having minimum function, irrespective of the sensor types (i.e., the sensor type may be optical, mechanical or magnetic).

It is the further object of the present invention to provide a computer system and a method for running its program easily by having the data input device.

It is the further object of the present invention to provide a computer system having a data input device, which does not require a user to buy an additional computer system. The data input device can be connected to the computer system because it is compatible with the conventional personal computer system.

It is another object of the present invention to provide a data input device that can serve as a station for interfacing a computer system with other input devices.

In accordance with the present invention, it is possible for a user to run a desired program by using the function card, which is inexpensive and provides various functions. From this, even though a user is not accustomed to using a program or is an illiterate child, it is possible to run the program easily through the explanations and drawings on the function card.

Also, in accordance with the present invention, a user does not have to buy an entire computer system, because the data input device can be connected to the conventional personal computer system.

Disclosure of Invention

In order to accomplish the above-mentioned objects, the present invention provides a data input device for providing data to run an application program of computer system, comprising: a function card on which functions of the application program and how to use the functions are expressed; a card holder for holding the function card; input means for selecting the functions of the function card or inputting data; a mouse plate for supporting the function card and sensing position of the input means; code sensing part for sensing insertion or extraction and identification number of the function card; data processing part for receiving data from at least one of the code sensing part, the input means and the mouse plate, and

interpreting the data; and, data transmitting part for transmitting the interpreted data by the data processing part to the computer system.

According to other aspect of the present invention, a data input method using the data input device comprises the steps of: sensing the insertion/extraction of the function card by the code sensing part and interpreting the sensed data through the data processing part; sensing the identification number of the function card by the code sensing part when the function card is inserted and interpreting sensed data through the data processing part; interpreting selected function of the function card through the data processing part based on input means position data and input means state data; and, transmitting the interpreted data by the data processing part to the computer system through the data transmitting part.

Also, according to another aspect of the present invention, a computer system containing a plurality of application programs comprises the data input device; data processing means for receiving data inputted through the data input device and processing the data so as to run the application program; and, application program function application program function service manager for receiving data processed by the data processing means and controlling running of the application program.

Brief Description of Drawings

Fig. 1 is a perspective view of the data input device according to one example of the present invention.

Fig. 2 shows an example of a function card used in the data input device as shown in the Fig. 1.

Fig. 3a shows one example of the printed marks in the first region.

Fig. 3b shows another example of the printed marks in the first region.

Fig. 4a shows sensor arrangement in the code sensing part corresponding to the printed marks as shown in Fig. 3a.

Fig. 4b shows sensor arrangement in the code sensing part corresponding to the printed marks as shown in Fig. 3b.

Fig. 5a is a perspective view of the code sensing part according to one example of the present invention.

Fig. 5b is a plane view of the sensor used in the code sensing part according to the present invention.

Fig. 6a is a perspective view of one example of a pen mouse as the input means.

Fig. 6b is a cross sectional view of one example of a pen hammer as the input means.

Fig. 7 shows an example of the use of the function card according to the present invention.

Fig. 8 shows an example of the application of the data input device according to the present invention.

Fig. 9 is a block diagram of the data input device and the computer system having the data input device according to the present invention.

Fig. 10 is a block diagram of the data processing means according to the present invention.

Fig. 11 shows data processing from the input means according to the present

invention.

Best Mode for Conducting the Invention

Hereinbelow, the preferred embodiments of the present invention are explained referring to the attached drawings.

Fig. 1 shows the data input device according to the present invention. Referring to Fig. 1, a data input device (100) according to the present invention provides data for running a program to a computer system. It includes a function card (110), a card holder (120) and a mouse plate (130). On the function card (110), there are descriptions regarding how to run the program with drawings and help messages. The function card (110) is inserted into and held by the card holder (120), and is located on the front surface of the mouse plate (130). If necessary, either the front surface or rear surface of the mouse plate (130) may be used.

The data for the function card (110), that is to say, insertion/extraction and identification number of the function card (110) are sensed in the code sensing part (150). The detailed functions of the function card (110) are selected by the pen mouse (140) as data input means. The data selected by the function card are sensed by the mouse plate (130) and are sent to data processing part. The data processing part is located on the mouse plate. It computes and interprets the data sensed by the mouse plate (130). Then, the data processing part provides the data to data transmitting part which in turn transmits the data to the computer system.

As shown in the Fig. 2, the function card (110) is divided into two regions; a first region (10) where codes are printed, and a second region (50) that describes the explanations regarding the program, detailed functions and how to use the functions of the program. The second region (50) is divided into, for example, a region (20) to display help message regarding how to use the functions of the program, a region (30) to display the function card name and a region (40) to display the detailed functions on the function card. The second region according to the present invention can be modified depending on the program and may not be limited to the above.

Fig. 3a and 3b show one example of the first region (10) where the codes are printed on the function card. The first region (10) of the function card is divided into two portions; a first portion (11) includes arranged marks that represent insertion/extraction of the function card and a second portion (12) includes arranged marks that represent an identification number of the function card.

The first region (10) of the function card (110) is a place where the codes are printed and provides the data regarding the inserted function card to the computer system. The codes and their arrangement are explained with reference to the Figs. 3 and 4.

In the Fig. 3a, the marks of the first region (10) are arranged in black or blank pattern. As shown in the Fig. 3a, if the mark exists, it has a rectangular shape that is filled to be black; otherwise, the mark does not exist (just blank). Such pattern differs in each function card. The pattern is repeated and represents the

codes.

As shown in the Fig. 3a, the number of the marks in the first portion (11) is I (any natural number) and the marks are arranged along the column direction. In the Fig.3a, the first portion (11) has no blank pattern (BL). The first portion (11) represents the insertion/extraction only and, therefore, it is unnecessary to make the sensing difficult by arranging the first portion (11) to have two, three or many columns and arrange the marks as black/ blank pattern. Namely, it is possible to sense the insertion of the function card by the existence of the marks only.

Fig. 4a shows the code sensing part (150) for sensing the first portion (10) as shown in the Fig. 3a. In the code sensing part (150), there is one sensor placed for each mark in the first portion (10). As shown in the Fig. 4a, S1 is a sensor corresponding to the first portion (11) and S2 is a sensor corresponding to the first mark in the second portion (12). The Figs. 3a and 4a show that the first portion (10) is composed of the total of six columns.

Referring to the Figs. 3a and 4a, the mark sensing and interpreting operations in the first portion (10) are explained below.

First, it needs to be noted that there is a difference between the sensor arrangement and the mark arrangement. As shown in the Fig. 4a, the marks have two-dimensional arrangement as a row and column, whereas the sensors have one-dimensional arrangement along a straight line. Since the code sensing part (150) can sense only one row of the marks each time, row scanning process is

needed as long as the number of the sensors are not equal to that of the marks.

The present invention makes it possible to sense all marks by using a motion for inserting or extracting the function card. Specifically, a user should insert the function card into or extract it from the data input device. Such motion is performed easily and fast. At the movement of the function card that is caused from the insertion/extraction motion, the code sensing part (150) sequentially senses the entire rows according to the movement.

For example, a user may push the function card (11) into and place it in the card holder. At this time, the code sensing part (150) can sequentially read from the first row to the last one during the movement of the function card (110).

Also, on the contrary, the user may extract the function card (110). At this time, the code sensing part (150) senses the marks from the last row to the first one. Through the above process, the code sensing part (150) can sense the marks arranged in two-dimensions with the sensors arranged in one-dimension.

Referring to the Fig. 3a, the marks in the first portion (11) and the second portion (12) are all black patterns at their first row. Thus, if the code sensing part (150) senses that the marks exist in every column at the first row, the data processing part interprets the sensed data to represent that the function card is inserted. The sensing operation of the code sensing part (150) continues. In the last row, if there is no sensed mark in the first portion (11) but there is a sensed mark (13) in the second portion (12), such data is interpreted in the data processing part

that the mark sensing is completed.

The function card extraction can be performed through the process contrary to the above-mentioned insertion process. At the beginning of the sensing operation, if no marks are sensed in the first portion (11), the mark (13) is sensed at the first row of the second portion (12), and marks are sensed having black patterns every column at the last row, this is interpreted to represent in the data processing part that the function card is extracted. Such arrangement may be modified, for example, by switching the first row arrangement to the last row arrangement.

Fig. 3b also shows one example of mark arrangement in the first region (10) of the function card. Unlike the Fig. 3a, the marks in the first portion are arranged in I(2 matrix in Fig. 3b. Blank part (BL) where there is no mark means one bit digital data "1" and black part (MK) where there is mark means one bit digital data "0." Thus, the mark arrangement in the first portion (11) corresponds to 2-bit digital data.

As mentioned above, the first portion (11) has value "00," "01," "10," "00," "01," "10," ..... from the first row as shown in Fig. 3b. If it is converted into decimal number, each value corresponds to 0, 1, 2, 0, 1, 2 .... from the first row. Namely, each value increases gradually from the first row and such increase is repeated periodically to the last row. In such case, as shown in the Fig. 4b, the code sensing part senses the above increase and the data processing part interprets that the function card is inserted. Also, it is possible to know the card extraction from

the periodic repetition of decrease in the mark value, i.e., 2, 1, 0, 2, 1, 0 ..... through the data processing part.

As described above, while the first portion (11) represents the insertion/extraction of the function card in Figs. 3a and 3b, the second portion (12) represents the identification number of the function card by arranging the marks N(M matrix (N and M are any natural numbers).

The marks of the first portion (11) and the second portion (12) are sensed each other at the same time, but the interpretation of the sensed marks in the first portion (11) is performed earlier than in the second portion (12). That is to say, after the sensed data from the first portion (11) is interpreted in the data processing part and information regarding whether the function card is inserted or extracted is transmitted to the computer system, the sensed data from the second portion (12) is interpreted. The data processing part interprets all marks in the second portion (12) from the first row to the Nth row and combines this, thereby making the identification number of the function card (110). For example, if the marks are arranged in 8 (4 matrix (N(M) in the second portion (12), the marks arranged in the second portion (12) represents the identification number of the function card which consists of 32-bit binary data. The 32-bit identification number provides information including program name, program manufacturing company, country, function number, etc., to the computer system.

As mentioned above, in the function card (110), the first portion (11) of the first region (10) provides data for the function card insertion/extraction from the

two-dimensionally arranged I(J (J=1 or 2) marks, and the second portion (12) provides data for the function card identification from the two-dimensionally arranged N(M marks. Thus, the first region (10) of the function card (110) can represent 2(2(N(M) codes by arranging the marks in various manner. This means that it is possible to provide 2(2(N(M) function cards.

Also, since the marks in the first portion (110) as shown in the Fig. 3b are arranged in zig-zag format, the code sensing part (150) senses the marks only when the arrangement of the marks is changed. Thus, it is not necessary to arrange the marks in an interval. In addition, the marks may have rectangular or circular shape, etc.

In the present invention, the function card (110) can be made of any insulating material, such as paper, synthetic resin, wood, cloth, etc. where characters, etc., can be printed thereon. Thus, the function card (110) of the present invention can be made of inexpensive material unlike the conventional IC card. It can be provided without any restriction on the number of the function cards by using the above-mentioned coding process.

Also, according to the present invention, printing is possible on the function card (110) either through a printer or manually. Thus, the present invention makes it possible for the user to make the function card that contains his desired program unlike the conventional IC card that contains the programs provided by the manufacturers only. Furthermore, it is possible to buy again or correct the function card easily even if it is damaged.

The Figs. 4a and 4b schematically show the code sensing part (150). As shown in the drawings, the code sensing part (150) comprises a plurality of sensors (S1, S2, ...) that are arranged along the straight line. The number of the sensors is equal to the total column number of the marks in the first portion (10). In Fig. 4a, the number of the sensors is, for example, 6. The number of the sensors can be changed depending on the arrangement of the marks.

Fig. 5a shows a perspective view of the code sensing part (150), and Fig. 5b shows a plane view of a sensor, which is one of the plurality of sensors that consist of the code sensing part (150).

The code sensing part (150) as shown in the Fig. 5a has a rectangular shape and a plurality of openings. The openings have a predetermined size and are arranged along the straight line. Each sensor is placed for each opening (51) inside the code sensing part.

The sensor (54) has a light emitting part (52) and a light receiving part (3) as shown in Fig. 5b. Light emitted from the light emitting part (52) of the sensor (54) reaches the mark at the corresponding column through the opening. If the mark exists as the black pattern, the light is absorbed and the mark corresponds to "0." On the contrary, if the mark does not exist (blank pattern), the light is reflected and the mark corresponds to "1." Thus, it is possible to sense the mark.

In the present invention, the required function for the sensor (54) is just to emit the light and receive the reflected light or the absorbed light. It is not required

that sensor have high sensitivity and be expensive one. As long as the sensor has the function that can emit the light and receive the reflected light within short distance, it can be used in the present invention.

In the above explanation, the sensor is mainly optical one, but is not limited thereto. The magnetic or mechanical sensors can be used.

Conventionally, in use of the above-mentioned sensor, the distance between the sensor and the function card is not constant and sensing range of the sensor is unclear due to the use of surrounding light. Therefore, it is not possible to sense the closely arranged mark with accuracy. However, in the present invention, through a sensor capsule (50) to cover the sensor wholly, it is possible to keep distance between the sensor and the function card constant by holding the sensor and adhering the function card closely to the sensor capsule. Also, through the opening (51), the sensing range is limited to the size of the opening (51). It can prevent the sensing range from being expanded to the marks adjacent mark that will be sensed.

Also, since the code sensing part (150) includes filtering part (not shown) that removes sensor noises and amplifies signal, it is possible to improve sensing accuracy.

The present invention can perform the necessary sensing operation by using the sensor having only minimum sensitivity through the code sensing part (150) as shown in Fig. 5. Thus, it is possible to highly reduce manufacturing cost than the device employing the sensor having high sensitivity.

The present invention can sense the number of codes on the function card by using the code sensing part (150) with a few sensors. Referring to the Fig. 3b, five sensors are arranged corresponding to the second portion of the first region in the code sensing part (150). Assume that length of the first region (10) is L and length of each mark is l. For example, if L is 1cm and l is 0.1cm, it is possible to create 210(5=250=1.1259(1015 codes. Thus, it is possible that the code sensing part (150) senses 1.1259(1015 codes with five sensors.

As mentioned above, in the present invention, it is possible to manufacture the function card without any restriction by creating a number of codes. Also, the code sensing part (150) according to the present invention can sense a number of codes with a few sensors. This is possible because the present invention employs a principle that makes it possible for the one-dimensionally arranged sensors to sense two-dimensionally arranged marks by scanning marks' row through insertion/extraction movement of the function card. In the present invention, the explanation is made based on the optical code sensing part. However, the code sensing part (150) can be implemented with any sensor type, i.e., optical, magnetic or mechanical sensors.

Power is supplied to the code sensing part (150) through serial, parallel or PS2 port from the keyboard terminal of the computer system. The data sensed from the code sensing part is sent to the data processing part for its interpretation.

Referring to the Fig. 1 again, the function card (110) is supported on either the front surface or the rear surface of the mouse plate (130). If the pen mouse

(140) as the input means selects a predetermined position on the mouse plate (130), the mouse plate (130) can sense the selected position.

The pen mouse (140) as the input means generates radio wave on the selected position of the mouse plate. The mouse plate includes a radio wave sensing part and senses the position of the pen mouse (140). The sensed position is sent to the data processing part and the value of the absolute/relative coordinates for the sensed position is computed.

The pen mouse (140) has three buttons as shown in Figs. 1 and 6a. Tip button (T) is formed on a pen tip of the pen mouse (140) and has the function similar to left button of the conventional mouse. Barrel button (B) is formed on body of the pen mouse (140) and has the function similar to right button of the mouse. As shown in Fig. 6a, the pen mouse (140) may have two barrel buttons (B), if necessary.

Also, the pen mouse (140) has mode button (M). The mode button (M) is to switch modes. The mode button (M) needs to be set for the function card input mode in order to select and carry out the functions on the function card by means of the pen mouse (140) when inserting the function card.

If the mode button (M) is set for the general input mode, selected function is not carried out even though the function card is inserted and the pen mouse (140) selects any function. Instead, the position selected by the pen mouse (140) is sensed by the mouse plate (130) and its coordinates are transmitted to the computer

system. As a result, operation other than the function of the function card, i.e., cursor movement or running of the application program, is done instead. The mode button (M) and the computer system operation are explained later.

The pen mouse (140) is connected to the data processing part as shown in Figs. 1 and 6a. Thus, the pen mouse provides data regarding pen mouse state (i.e., whether tip, barrel or mode buttons are pressed or not) directly to the data processing part.

The data input device (100) according to the present invention may employ a pen hammer in addition to the pen mouse (140). Fig. 6b shows a cross sectional view of the pen hammer (60), which is used as the input means in the data input device (100) according to the present invention.

The pen hammer (60) according to the present invention includes blow part (61) for hitting the mouse plate (130), elastic part (64) for relenting shock caused from the blow of the blow part and connection part (65) for connecting the blow part (61) with the elastic part (64). Also, on one side of the connection part (65), a plurality of concave portions are formed and a plurality of sensors are formed. One sensor is placed for each concave portion.

Radio wave generating part (62) is located above the blow part (61) of the pen hammer (60). The mouse plate (130) senses radio wave generated by the radio wave generation part (62) and recognizes the position coordinates of the pen hammer as in the pen mouse (140).

According to the present invention, the blow intensity of the pen hammer (60) to the mouse plate (130) can be used for further application. When the blow part (61) hits the mouse plate, the connection part (65) goes up due to the shock and the sensors (63) sequentially turn on. On-time difference among the sensors (63) is calculated as blow speed. From the speed, it is possible to compute the blow intensity.

The blow intensity of the pen hammer (60) can be applicable when the function card contains the program that requires additional input besides the position coordinates. For example, if the function card is related to playing an instrument, sound volume as well as note (for example, Do, Re, Mi,...) can be selected by using the pen hammer (60).

The pen hammer (60) according to the present invention is not limited to one shown in Fig. 6b in terms of its structure and shape, and it can be modified.

The data input device (100) according to the present invention further includes input button other than the pen mouse (140) and the pen hammer (60). The input button is formed on the mouse plate (130). For example, the input button may be direction button for manipulating four and more directions or function button whose function is defined by a user. The function button may be an enter key or a space key on the key board.

According to the present invention, the pen mouse, the pen hammer or the input button can be used either alone or in combination.

Referring to the Fig. 1 again, the data input device (100) of the present invention includes display means (DS1, DS2) that consists of light emitting diode, for example. The display means (DS1) turns on if the function card operates in normal mode and turns off if the function card is suddenly extracted. The display means (DS2) turns on when power is supplied.

As mentioned above, the data sensed through the code sensing part (150), the data sensed through the mouse plate and the data from the input means such as the pen mouse (140) and the pen hammer (60) are transmitted to the data processing part. The data processing part is located on the mouse plate (130) and includes a memory means for data storage and a microprocessor. The memory means and the microprocessor may be formed integrally. The known 8-bit or 1-bit microcomputer may be used as the microprocessor in the present invention.

The data processed by the data processing part is transmitted to the data transmitting part (not shown). The data transmitting part includes a communication part for transmitting the data processed by the data processing part to the computer system or receiving the data from the computer system. The data transmitting part also includes a connecting part for connecting the communication part with the computer system.

The Fig. 7 shows an example for one use of the computer system (200) having the data input device according to the present invention. In the Fig. 7, the function card (100) is inserted into the data input device (100) and, then selects the function by using the pen mouse (140).

While the data input device according to the present invention is explained in connection with the computer system, it can also be used as a station that interfaces the computer system with other input device. Fig. 8 is a block diagram that schematically shows such structure of the present invention.

As shown in the Fig. 8, an input of a converter (402) for application apparatus is connected to the data transmitting part (170) of the data input device (100), while an output of the converter (402) is connected to the application apparatus (403). For example, if the application apparatus is an internet TV, the input of the set top box (402) is connected to the data transmitting part (170) of the data input device (100) and the output of the set top box (402) is connected to the TV, thereby making it possible to use the internet.

Also, the data input device (100) of the present invention further includes external input device transmitting/receiving part (400) and communicates with the external input device (401) such as a joystick, a remote controller, etc. As above, in the data input device (100) according to the present invention, the external input device transmitting/receiving part is added as another input terminal and separate apparatus is connected to its output side. Thus, it is possible to use the data input device (100) as one station concept.

The external input device transmitting/receiving part (400) includes a connection part for transmitting and receiving data with a wire/wireless and signal conversion part. In the external input device transmitting/receiving part (400), the connection part transmits or receives data either through wire transmission such as

serial or parallel port, joystick port or connector having narrow pitch, or through wireless transmission including RF wave, infrared light, etc. The signal conversion part converts either the signal received from the connection part so that it can be transmitted to the data processing part (160) and the data transmitting part (170) or the signal received from the data transmitting part (170) so that it can be transmitted externally.

Referring to the Fig. 8, when input signal from the external input device (401) is transmitted to the external input device transmitting/receiving part (400), the data is transferred to the data processing part (160). The data processing part (160) transmits the processed data to the data transmitting part (170). If the data input device (100) is connected to the TV system (402) as in the above-mentioned example, the signal from the data transmitting part (170) is converted and transmitted to the internet set top box (402). Through the internet set top box (402), the data is finally transmitted to the TV. According to the present invention, it is possible to employ a special operation apparatus besides TV, for example, network apparatus or FA apparatus.

Hereinafter, a computer system (200) having the data input device according to the present invention and a method for running program are explained by referring to Figs. 9 to 11.

Fig. 9 is a block diagram that shows the entire structure of the computer system having the data input device according to the present invention.

(100) is the data input device according to the present invention. As mentioned above, in the data input device (100), the data from the code sensing part (150) for sensing the data for the function card (110), the mouse plate (130) for sensing position selected by the input means (180), the input means (180) and the input button (190) are sent to the data processing part (160). The processed data is sent to the computer system (200) through the data transmitting part (170).

The data processing means (210) receives the data transferred from the data transmitting part (170) as shown in Fig. 8. The data processing means (210) analyzes the received data as to whether it is related to the function card or not. If the data is related to the function card, the data processing means (210) provides the data to application program function application program function service manager (220: hereinafter, referred to the "service manager").

If the data from the input means (180) and the input button (190) is related to the function card (for example, the input means (180) selects the detailed function of the function card), such data is analyzed and sent to the service manager (220) through the data processing means. However, in case that the input means (180) is set as general input mode by pressing the mode button of the pen mouse (140) or extracting the function card, such data from the input means is sent to the operating system (230) or the application program (240).

The service manager (220) receives the data for the function card from the data processing means (210) and runs or finishes the application program. Also, the service manager (220) instructs the application program to carry out its detailed

function.

If the input means (180) such as the pen mouse (140) is set as the general input mode or the function card is not inserted, the operating system (230) or the application program (240) receives the data from the data processing means (210). For example, if the tip button of the pen mouse (140) is pressed, a function corresponding to the "click" of the conventional mouse is carried out. If the application program is running, the function corresponding to the position selected by the pen mouse (140) is carried out.

Meanwhile, the mouse plate (130) is set to have the same resolution with the monitor of the computer system. Thus, if the running application program is displayed on the monitor, the pen mouse (140) as the input means (180) can select the application program on the monitor by selecting the corresponding position on the mouse plate (130).

Hereinafter, the data processing means (210) is explained by referring to Fig. 10.

The data processing means (210) includes a data receiving module (91) that receives the data inputted from the data input device (100). The data receiving module transfers the received data to the data analysis module (93).

The data analysis module (93) analyses the data and provides it to the function card data processing module (94) when the data is concerned with the

function card, i.e., its insertion/extraction and its identification number. Also, the data analysis module (93) plays a role to create system information that is transmitted to the data input device (100) through the data transmitting module (92) from the computer system. The system information is information that is re-composed to be used for protocol between the data input device (100) and the computer system.

The data processing means (210) includes input means data processing module (95) and system data processing module (96). If the data analyzed by the data analysis module (93) is related to the input means, the input means data processing module (95) processes this data and transmits it to one of the service manager (220), application program and operating system. The system data processing module (96) searches and re-news the computer system according to computer system modification information that is transferred from the service manager (220). The system data processing module (96) searches and re-news the computer system status, when it is changed (in particular, resolution change).

The input means data processing module (95) includes input means position data processing means (97), input means state data processing means (98) and button data processing means (99). The input means position data processing means (97) transfers data analyzed by the data analysis module (93) to one of the service manager (220), application program (240) and operating system (230) if the data is related to the position change of the input means. The input means state data processing means (98) transfers data analyzed by the data analysis module (93) data to the service manager (220), application program (240) or operating system (230)

if the data is related to the state button of the input means. The button data processing means (99) transfers data analyzed by the data analysis module (93) to the service manager (220), application program (240) or operating system (230) if the data is related to direction buttons or function buttons.

The data for the input means position, button data and input means state data, which are processed by the data processing means (210), are sent to either of the service manager (220), the application program and the operating system based on the mode button state data or the data representing that the function card is extracted.

If the mode button is set as the input mode for the function card, the data for the input means position, button data and input means state data (for example, the data representing that the tip button is pressed) are all transmitted to the service manager (220). The service manager (220) receives the data representing the function card insertion and its identification number, and searches registry that contains registration information for the application program corresponding to the function card. Then, the service manager (220) activates the application program. After then, the service manager (220) receives the data regarding the input means position or the button state and controls the application program to carry out the detailed function corresponding to such data.

Meanwhile, if the mode button is set as the general input mode, the input means position data, etc. is sent to the operating system (230) or the activated application program (240). At this time, even though the service manager (220)

received the data for the function card insertion and activated the corresponding application program before setting of the general input mode, the input means position data, etc. is not provided to the service manager (220).

The service manager (220) manages and runs the application program corresponding to the function card. Specifically, the service manager starts and stops the application program depending on the data received from the function card data processing module (94). Also, while the application program is activated, the service manager checks the function of the function card based on the data received from the input means data processing module (95) and informs the application program of such data.

The service manager (220) controls all application programs which the function card can provide, unlike usual manager program which controls only one program. Also, the service manager controls the display resolution or checks the computer system like the operating system, if necessary. Thus, the service manager (220) can control the running of the application program in an active manner.

The service manager (220) includes data transmitting/receiving module that transmits searched data from the computer system (200) or receives the data from the data processing means (210). It also includes registry data processing module for searching the data registry of the application program based on the function card data and processing the searched data. The service manager (220) can find the application program that corresponds to the function card data by the registry data processing module.

In addition, the service manager (220) includes resolution control module for controlling the display resolution based on the registry data, and system status processing module for checking the computer system and the application program. Thus, the service manager (220) understands the computer system status, the application program status and sets these status properly, thereby making it possible to run the application program smoothly. Also, the service manager further includes program running module for recognizing the application program status corresponding to the function card data that is received from the data processing means (210) and controlling the application program to start, finish, or carry out the application program or its detailed function.

As mentioned above, in the present invention, the function card is inserted into the data input device (100) and the data for the identification number of the function card is sent to the computer system. Then, in the computer system, the application program, which corresponds to the identification number of the function card, is activated under the control of the service manager. Then, if the detailed function of the function card is selected by the input means, that data is provided to the service manager and the detailed function of the application program (corresponding to the selected function of the function card) is carried out.

For example, assume that the function card (110) shown in Fig. 2 is inserted into the data input device (100) and the corresponding application program is activated and displayed on the monitor of the computer system. A user checks whether the application program corresponding to the function card (110) is running from the monitor, and selects one of animals as shown in the Fig. 2 by using the pen

mouse, etc. If the pen mouse is used, the animal is selected by pressing the pen tip button to that animal.

These pen tip state and position data of the pen mouse is transmitted to the data processing part through the pen mouse and the mouse plate. The processed data is sent to the service manager (220) through the data processing means of the computer system. The service manager (220) searches the data registry and finds the detailed function of the application program, which corresponds to the selected animal. The service manager (220) informs the application program (240) of the detailed function. As a result, the user can look at and hear the explanation for the selected animal, motion picture, etc. through the computer system.

Now, it is explained how the data is inputted into the computer system (200) through the data input device (100) in the general input mode.

Referring to the Fig. 11, the input means (180) substantially provides two types of data to the data processing part. One is input means state data (305) representing whether the tip button, the mode button and the barrel button are pressed or not. This data is directly provided to the data processing part from the input means. The other is input means position data (306) that is sensed by the mouse plate.

As shown in the Fig. 10, the two types of data are processed and interpreted by the data processing part (303). Then, they are sent to the data processing means (304). When the data is transmitted, the function card is either inserted (300) and

in operation (301) or extracted (302). The data from the input means has a different meaning depending on the insertion or extraction of the function card.

When the function card is inserted, it is possible to select the detailed function on the function card by using the input means. As mentioned above, the selection by the input means indicates the selection for the detailed function of the application program that is activated. For example, if the input means is the pen mouse and the tip button is pressed on the detailed function expressed on the function card, the users instructs to carry out that function. The service manager makes the application program carry out the detailed function.

Meanwhile, if the function card is not inserted or the function card is inserted but the mode button of the input means (180) is set as the general input mode, the input means is considered the same as the conventional mouse. Namely, even though the function card is inserted, it is not possible to carry out the detailed function of the application program by selecting the detailed function on the function card with the input means (180), which is set as the general input mode. This is because such data is not provided to the service manager. Thus, even if the input means moves on the function card in the general input mode, the user just notices that the mouse's cursor is meaninglessly moving on the monitor of the computer system.

As mentioned above, if the mode button is set as the general input mode, the input means (180) is made to lock so that it cannot input anything on the function card. When such locking is released, it is possible to input on the function card.

In the present invention, it is possible to switch the mode. Thus, even if the function card (110) is inserted and in operation, the input means may be used as the conventional mouse, if necessary. This is made it possible by setting the mode button of the input means (180) as the general input mode. In addition, in case that the security is needed because many users utilize only one computer or that parent prevents the children from damaging the data file or running other application programs because the parent and children use the computer system together, the function card can be initially set to contain the locking that prohibits other input when using the function card.

Industrial Applicability

As mentioned above, the present invention provides the data input device that can run the application program through the function card, which explains easily and specifically the function of the application program.

In accordance with the data input device of the present invention, the function card is made of insulating material such as paper. Thus, it is possible to reduce manufacturing cost. Also, it is easy to manufacture the function card because it can be printed even manually. In addition, information that is necessary for the use of the program can be expressed as drawings or help messages on the function card.

Also, the function card can represent many programs by using the unique coding process. The function card is easily kept and re-made when it is damaged.

Through the function card, it is possible to reduce the entire manufacturing cost and to provide various programs without any restriction.

In accordance with the present invention, it is possible to sense the codes of the function card with a few sensors. It is not required that the sensor has high sensitivity. Thus, the code sensing can be accomplished with relatively cheap sensor having minimum function. By employing this sensor, the entire manufacturing cost of the data input device is sufficiently reduced.

The present invention provides the data input method using the data input device. One of important technical features in the data input method according to the present invention is to read the marks corresponding to the codes of the function card through the code sensing part having a few sensors. In the code sensing part, there is one sensor placed for each column of the marks. The sensors are arranged in one-dimension along the straight line. Such sensors sense the marks arranged in two-dimension.

In the data input method in accordance with the present invention, the code sensing part sequentially scans and senses the plural rows of the marks through the insertion/extraction of the function card. In other words, the code sensing part can sequentially senses the two-dimensionally arranged marks with the one-dimensionally arranged sensors at the time when the user inserts or extracts the function card. It can be performed by either the user or machine.

As above, by using the simple process that inserts or extracts the function

card in code sensing, it is possible to simplify the code sensing part. Therefore, there is such advantage that can reduce the manufacturing cost.

Also, the present invention provides the computer system having the data input device. The computer system includes the service manager that starts, finishes the application program, or carries out the detailed function by receiving the data inputted from the data input device.

The service manager not only runs the application program according to the function card data but also checks the computer system state and/or the application program state and actively controls them. In particular, the service manager controls the resolution of the computer system so that the application program is properly run.

The general personal computer may be used as the computer system having the data input device according to the present invention. Thus, it is possible to perform both task through the general computer and the task through the function card at the same time. This is because the input mode for the function card and the general input mode can be switched each other. Such mode switching is implemented by using the mode button of the input means. If the function card is not inserted or the mode button is set as the general input mode, the input means is similar to the conventional mouse.

Meanwhile, if the function card is inserted, the state and position of the input means first represents the function selection on the function card. However, if the

mode button is set as the general input mode, the data from the input means is not provided to the service manager. Thus, under the general input mode, the input means such as the pen mouse, etc. runs the application program or makes the cursor move like the mouse. As such, it is possible to increase the task process range and compatibility of the computer system through such input data processing using the mode switching.

Also, the present invention also provides the method for running the application program of the computer system. The application program is controlled by the service manager when the function card is inserted. The insertion and the identification number of the function card is sensed, interpreted and sent to the computer system. The data process means processes that data and sends the processed data to the service manager. As a result, the application program is activated.

If there is an input through the input means after activating the application program, i.e., the input means selects the function displayed on the function card and instructs to carry out it, the input means data is provided to one of the service manager, the operating system and the application program depending on the input means mode. As such, the operation corresponding to the data is performed.

Various other modifications will be apparent to and can be readily made by those skilled in the art without departing from the scope and spirit of the present invention. Accordingly, it is not intended that the scope of the claims appended hereto be limited to the description as set forth herein, but rather that the claims be

broadly construed.

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WHAT IS CLAIMED IS:

1. A data input device for providing data to run an application program of computer system, comprising:

a function card on which functions of the application program and how to use the functions are expressed;

a card holder for holding the function card;

input means for selecting the functions of the function card or inputting data;

a mouse plate for supporting the function card and sensing position of the input means;

code sensing part for sensing insertion or extraction and identification number of the function card;

data processing part for receiving data from at least one of the code sensing part, the input means and the mouse plate, and interpreting the data; and,

data transmitting part for transmitting the interpreted data by the data processing part to the computer system.

2. A device according to Claim 1, the function card comprising:

a first region having printed function codes, the codes representing insertion/extraction and identification number of the function card; and,

a second region for enabling the user to understand and select the functions of the function card;

3. A device according to Claim 2, the first region comprising:

a first portion having arranged marks, the marks representing

insertion/extraction of the function card; and,

a second portion having arrange marks, the marks representing identification number of the function card.

4. A device according to Claim 3, wherein the marks are arranged in a matrix consisting of a row and a column.

5. A device according to Claim 2, wherein the second region comprises at least one of:

a region including a help message for explaining how to use the functions of the application program;

a region indicating a name of the function card; and,

a region showing detailed functions and drawings that are indicative of the detailed functions.

6. A device according to Claim 2 or 5, wherein the function card is made of material that makes the first region and the second region printable by either machine or manually.

7. A device according to Claim 6, wherein the function card is made of insulating material consisting of paper, synthetic resin, wood or cloth.

8. A device according to Claim 3, the code sensing part comprising:

a plurality of sensors for sensing the marks, each of sensor including light emitting part and light receiving part and placed for each column of the marks

arranged in the first region;

a sensor capsule for fully covering and holding the plurality of sensors so as to improve the accuracy of the sensor, the sensor capsule having a plurality of openings on its top surface, each of which corresponding to each sensor; and,

a filtering part for removing noises of the sensor and amplifying signal.

9. A device according to Claim 8, wherein the sensor includes a first sensor section and a second sensor section, the first sensor section being assigned to the first portion and the second sensor section being assigned to the second portion; and,

wherein the first sensor section senses the marks of the first portion and provides data representing the insertion/extraction of the function card to the data processing part, and the second sensor section senses the marks of the second portion and provides the data representing the identification number of the function card to the data processing part.

10. A device according to Claim 1, the mouse plate comprising:

a plate for supporting the function card on either its top surface or rear surface; and,

a sensing part for sensing position of the input means moving on the top surface or rear surface of the plate.

11. A device according to Claim 1, wherein the input means is a pen mouse.

12. A device according to Claim 11, the pen mouse comprising:

function button for selecting functions of the function card or the application program, and,

mode button for switching between function card input mode and general input mode;

wherein the pen mouse provides data representing the button state to the data processing part.

13. A device according to Claim 1, wherein the input means is a pen hammer, the pen hammer comprising:

blow part for hitting the mouse plate;

radio wave generating part located above the blow part;

elastic part for absorbing shock caused from the blow of the blow part;

connection part for connecting the blow part with the elastic part, the connection part having a plurality of concave portions on one side; and,

a plurality of sensors formed corresponding to the plurality of concave portions;

14. A device according to Claim 13, wherein the pen hammer provides data representing turn-on time difference among the sensors to the data processing part, and the data processing part computes blow speed and blow intensity of the pen hammer to the mouse plate therefrom.

15. A device according to Claim 11 or 13, the data input device further comprising:

direction buttons for manipulating directions, and,

a plurality of input buttons for performing a predetermined function.

16. A device according to Claim 1, the data processing part comprising:

memory means for storing at least one of data selected from the group consisting of the function card data sensed by the code sensing part, input means state data and input means position data sensed by the mouse plate; and,

a microprocessor for operating, processing and interpreting each data stored in the memory means.

17. A device according to Claim 1, the data transmitting part comprising:

a communication part for transmitting the data processed by the data processing part and receiving data transmitted from the computer system; and

a connecting part for connecting the communication part with the computer system.

18. A data input method using a data input device, wherein the data input device comprises: a function card for expressing functions of the application program and how to use the functions thereon, the function card including a first portion having arranged marks representing insertion/extraction of the function card and a second portion having arranged marks representing identification number of the function card, in which the marks of the first portion are arranged in a plurality of rows and one or two column, and the marks of the second portions are arranged in a plurality of rows and columns; a card holder for holding the function card; input means for selecting the functions of the function card or inputting data; a mouse plate for

supporting the function card and sensing position of the input means; code sensing part having a first sensor section assigned to the first portion and a second sensor section assigned to the second portion, wherein the first sensor section has one or two sensors and each sensor of the second sensor section is placed for one column of the marks in the second portion, and, the sensors in the first sensor section are arranged adjacent to the sensors in the second sensor section in a row direction; data processing part for receiving data from at least one of the code sensing part, the input means and the mouse plate and interpreting the data; and data transmitting part for transmitting the interpreted data by the data processing part to the computer system, the method comprising the steps of:

sensing the insertion/extraction of the function card by the code sensing part and interpreting the sensed data through the data processing part;

sensing the identification number of the function card by the code sensing part when the function card is inserted and interpreting sensed data through the data processing part;

interpreting selected function of the function card through the data processing part based on input means position data and input means state data; and,

transmitting the interpreted data by the data processing part to the computer system through the data transmitting part.

19. A method according to Claim 18, the step for sensing and interpreting the insertion/extraction and identification number of the function card comprising:

a) sensing the marks in the first portion by using the sensors in the first sensor section, each sensor emitting light having a predetermined intensity to the mark of the corresponding column and receiving the reflected light in response to

the emitted light at every row in the first portion,

b) sensing the marks in the second portion by using the sensors in the second sensor section, each sensor emitting light having a predetermined intensity to the mark of the corresponding column and receiving the reflected light in response to the emitted light at every row in the second portion, and,

c) transmitting the data obtained from the mark sensing to the data processing part at every row; and,

wherein the first sensor section and the second sensor section sequentially sense the rows of the marks along the movement of the function card in a column direction of the marks, and sense the marks in a next row of a predetermined row after the marks of both the first portion and the second portion in the predetermined row are sensed.

20. A method according to Claim 19, wherein the data processing part determines that the mark sensing operation is completed when the first sensor section does not sense the marks and the second sensor section senses the marks.

21. A method according to Claim 19, wherein the data processing part determines that the function card is inserted or extracted when all sensors in the first sensor section and the second sensor section sense the marks at a first row where the sensing operation begins.

22. A method according to Claim 19, wherein the marks of the first portion are arranged in a plurality of rows and two columns and two marks at every row represent 2-bit digital data.

23. A method according to Claim 22, wherein the data processing part determines that the function card is inserted when the digital data value is increased in a column direction repeatedly.

24. A method according to Claim 22, wherein the data processing part determines that the function card is extracted when the digital data value is decreased in a column direction repeatedly.

25. A method according to Claim 19, wherein 2(row numberXcolumn number) codes are created by combining the marks sensed in the step (b).

26. A method according to Claim 18, wherein the input means state data includes locking information to lock the input for the function card, thereby making the function of the function card not selected.

27. A computer system containing a plurality of application programs, comprising:

said data input device claimed in Claim 1;

data processing means for receiving data inputted through the data input device and processing the data so as to run the application program; and,

application program function application program function service manager for receiving data processed by the data processing means and controlling running of the application program;

28. A computer system according to Claim 27, the data processing means

comprising:

data receiving module for receiving data from the data input device;

data transmitting module for transmitting system information from the computer system to the data input device;

data analysis module for analysing the data received by the data receiving module and preparing the system information sent to the data input device through the data transmitting module;

function card data processing module for providing the data analyzed by the data analysis module to the application program function service manager when the data is related to the function card;

input means data processing means for providing the data analyzed by the data analysis module to one of the application program function service manager, operating system and application program when the data is related to the input means; and,

system data processing module for searching and renewing the computer system based on computer system modification information transmitted from said application program function service manager.

29. A computer system according to Claim 28, wherein the input means includes state button which defines function or input mode; and,

the data input device further includes direction button for manipulating the direction and a plurality of input buttons for performing a predetermined function; and,

the input means data processing module includes:

input means position data processing means for transmitting the data

analyzed by the data analysis module to one of the application program function service manager, the application program and the operating system in case that the data is related to the position change of the input means on the mouse plate;

input means state data processing means for transmitting the data analyzed by the data analysis module to one of the application program function service manager, the application program and the operating system when the data is related to the state button of the input means; and,

button data processing means for transmitting the data analyzed by the data analysis module to one of the application program function service manager, the application program and the operating system when the data is related to the direction button or input button.

30. A computer system according to Claim 29, the application program function application program function service manager comprising:

data transmitting/receiving module for transmitting data searched from the computer system and receiving data from the data processing means,

registry data processing module for searching data registry of the application program corresponding to the function card data received from the data transmitting/receiving module,

display resolution control module for controlling the display resolution based on the registry data of the application program or the data from the data processing means,

system state processing module for checking the state of the computer system and the application program and for providing the checked data to the system data processing module of the data processing means, and,

program running module for controlling running or finishing the application program or carrying out detailed function, respectively, based on the function card data;

wherein the registry data processing module provides the searched data to the program running module.

31. A computer system according to Claim 30, wherein

the registry data processing module receives the selected function data of the function card from the input means state data processing means and searches the corresponding detailed function from the registry of the corresponding application program; and,

the program running module carries out the corresponding detailed function based on the searched data.

32. A computer system according to Claim 29, wherein the state button of the input means includes a mode button for switching the input mode of the input means between the input mode for the function card and general input mode; and,

the input means position data processing means, input means state data processing means, and the button data processing means provide the position change data, the state data and the button data to one of the application program function service manager, the operating system and the application program.

33. A computer system according to Claim 32, wherein the mode button is set as input mode for the function card, and the input means position data processing means, input means state data processing means, and the button data processing

means provide the position change data, the state data and the button data to the application program function service manager, respectively.

34. A computer system according to Claim 32, wherein the mode button is set as general input mode, and the input means position data processing means, input means state data processing means, and the button data processing means provide the position change data, the state data and the button data to the operating system or the application program, respectively.

35. A method for running application program of computer system, wherein the computer system comprises the data input device claimed in Claim 1; data processing means for processing data inputted through the data input device; and, an application program function application program function service manager for receiving the data processed from the data processing means and controlling the application program, the method comprising the steps of:

inserting the function card;

sensing and interpreting the function card insertion and its identification number;

transmitting data obtained from the interpretation to the data processing means;

processing the data in the data processing means and transmitting it to the application program function service manager; and,

searching and running the application program corresponding to the identification number of the function card among the data transmitted to the application program function service manager.

36. A computer system according to Claim 35, the method further comprising the steps of:

selecting a predetermined detailed function by using the input means;

transmitting state data and position change data of the input means to the data processing means when selecting the function;

providing the data received in the data processing means to the application program function service manager; and,

transmitting instruction for carrying out the corresponding detailed function to the running application program by searching the function corresponding to the received data by the application program function service manager.

37. A computer system according to Claim 35, the method further comprising:

selecting a predetermined detailed function by using the input means;

transmitting state data and position change data of the input means to the data processing means when selecting the function;

detecting the input means state indicating to lock the input to the function card from the data received from the data processing means; and,

providing the state data and the position change data of the input means to the operating system or the application program based on the detected data.

38. A device according to Claim 1, wherein the data input device further comprises external input device transmitting/receiving part located on the mouse plate, the external input device transmitting/receiving part comprising:

connection part for transmitting and receiving data with wire/wireless from external; and,

signal conversion part for converting signal received from the connection part to signal transmitted to the data processing part or the data transmitting part and converting signal received from the data transmitting part to signal externally transmitted.

39. A device according to Claim 38, wherein the data transmitting part is connected with application apparatus through a converter for the application apparatus.

40. A device according to Claim 39, wherein the application apparatus is an internet TV and the converter is a set top box for the internet TV.

FIG. 1

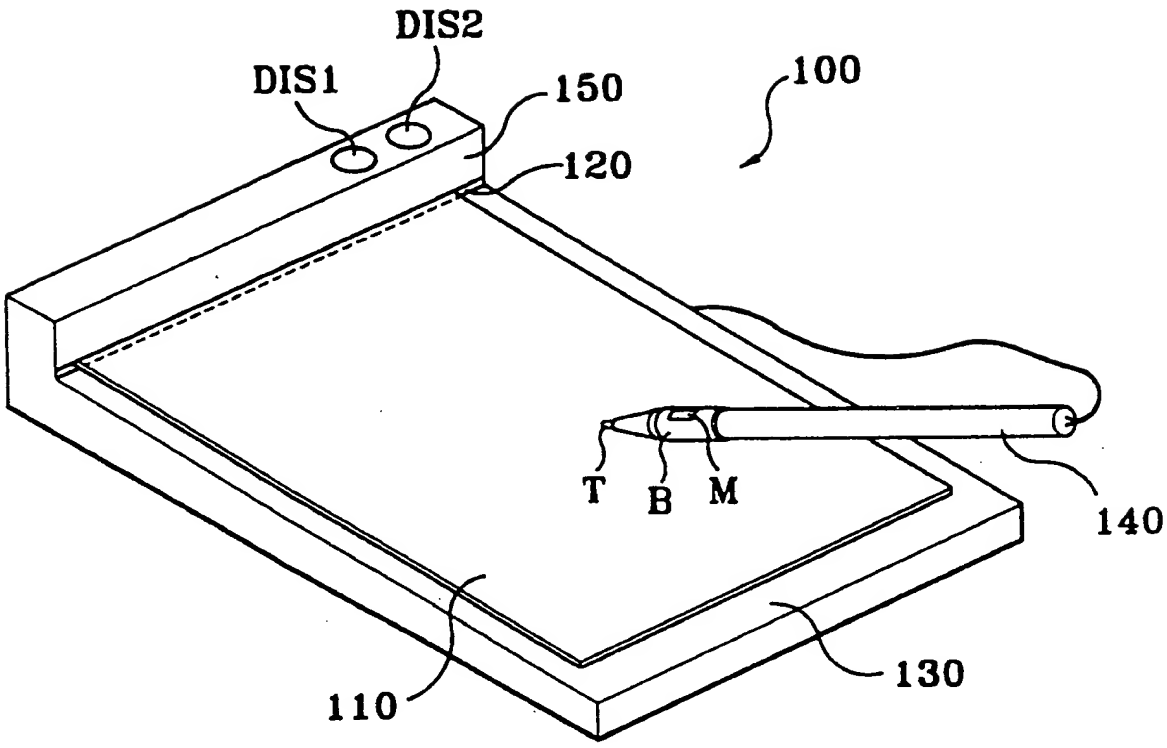


FIG. 2

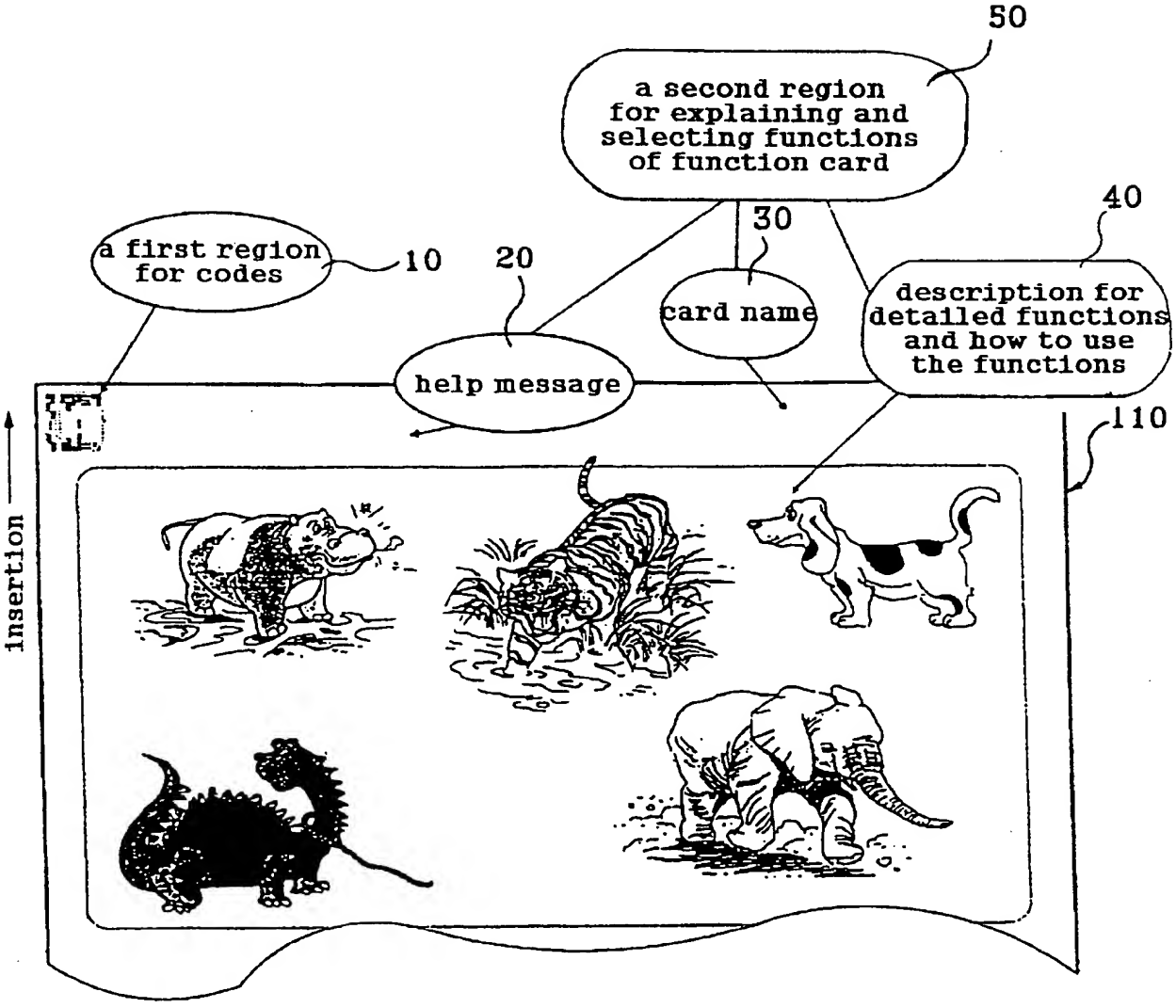

50
a second region for explaining and selecting functions of function card
40
30
a first region for codes
10
20
card name
description for detailed functions and how to use the functions
help message
110
insertion

FIG. 3a

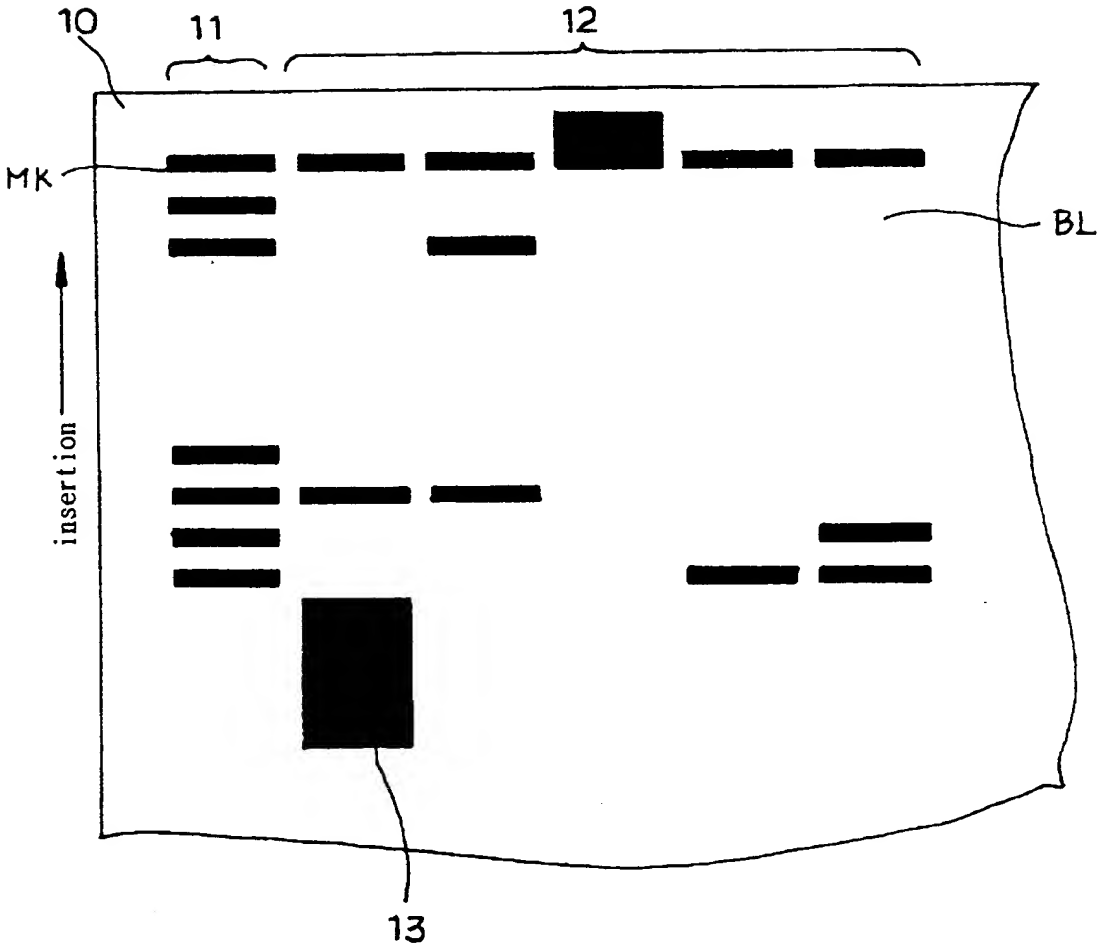


FIG. 3b

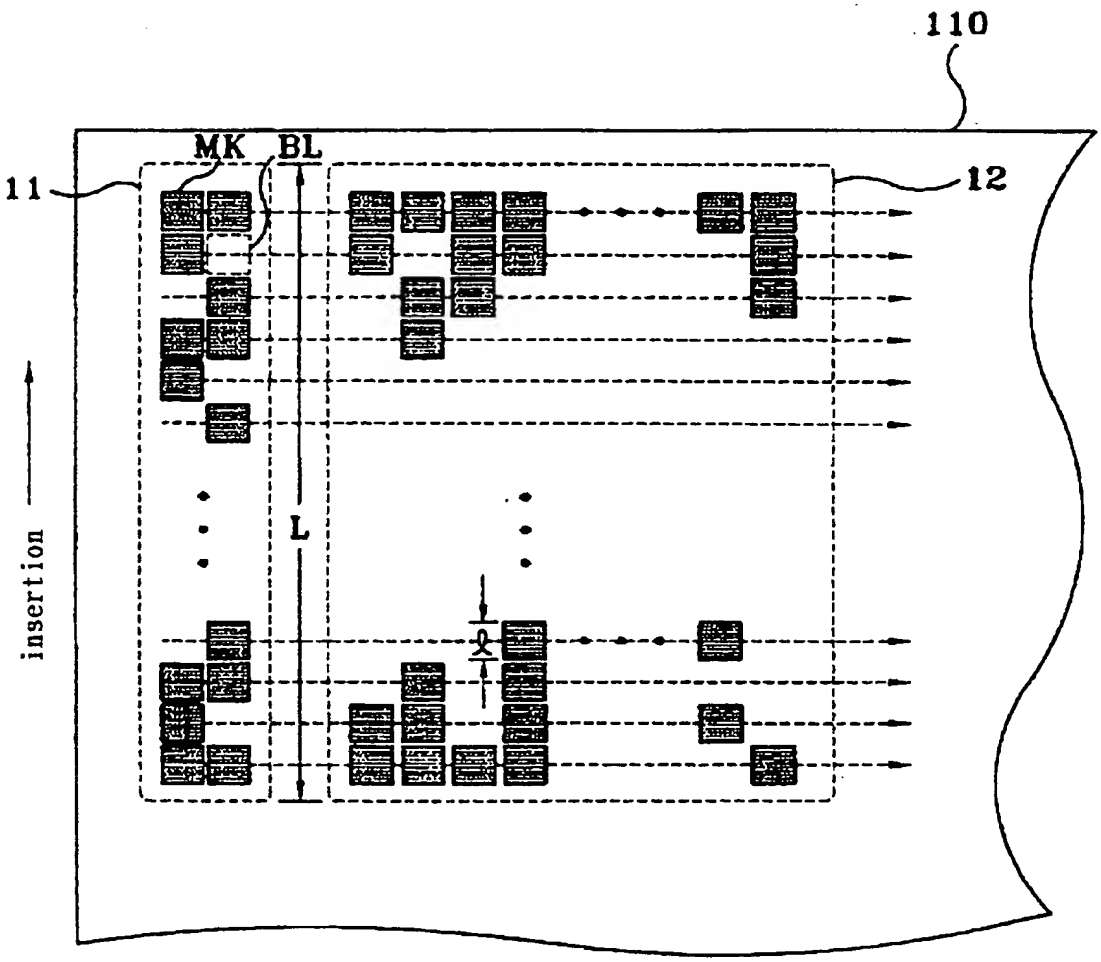


FIG. 4a

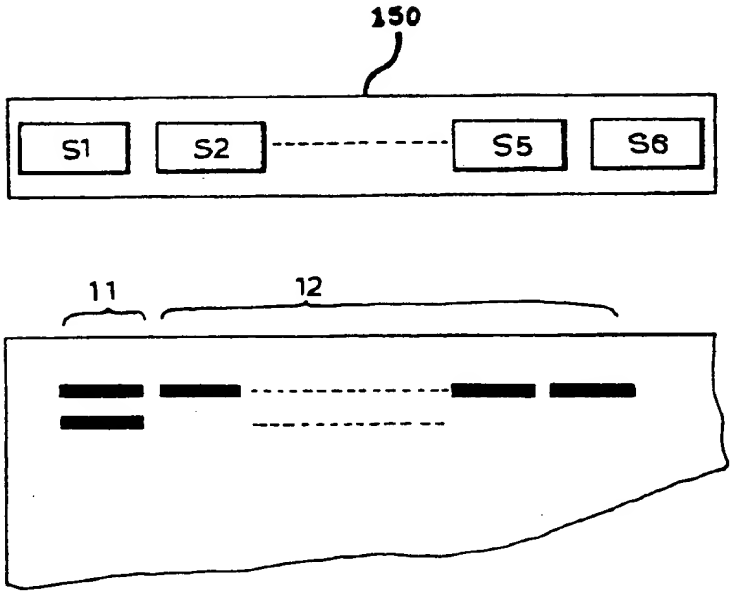


FIG. 4b

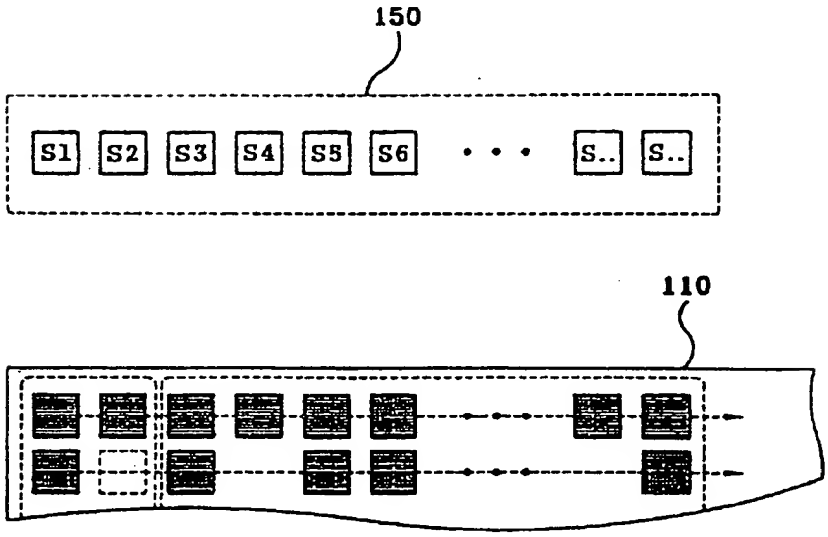


FIG. 5a

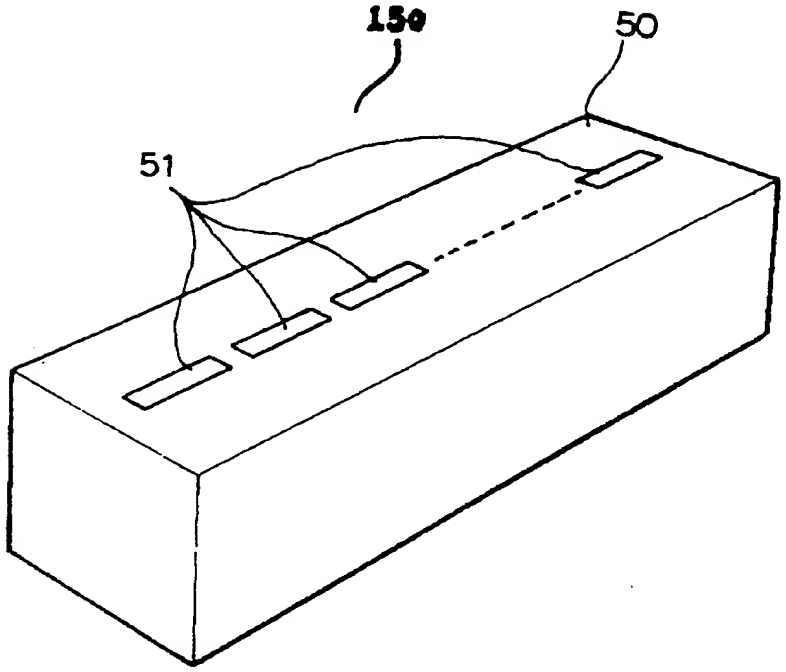


FIG. 5b

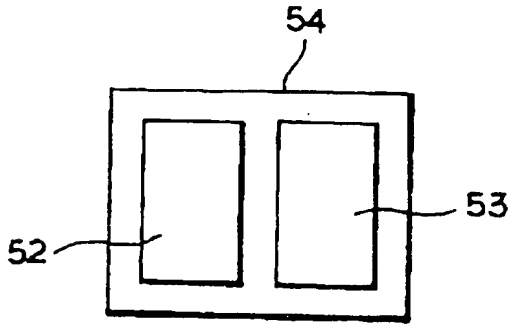


FIG. 6a

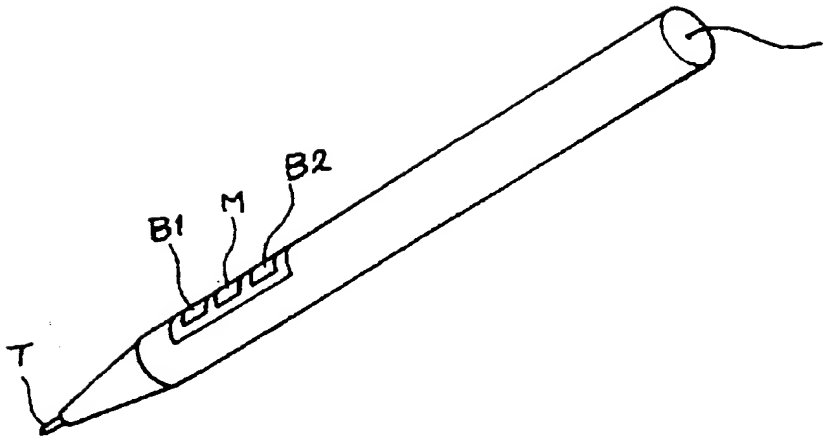


FIG. 6b

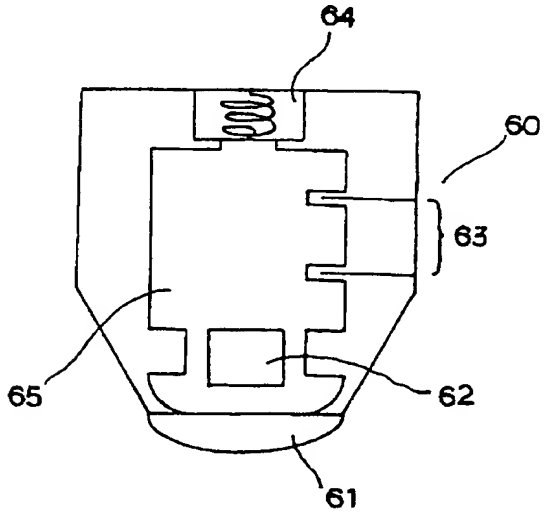


FIG. 7

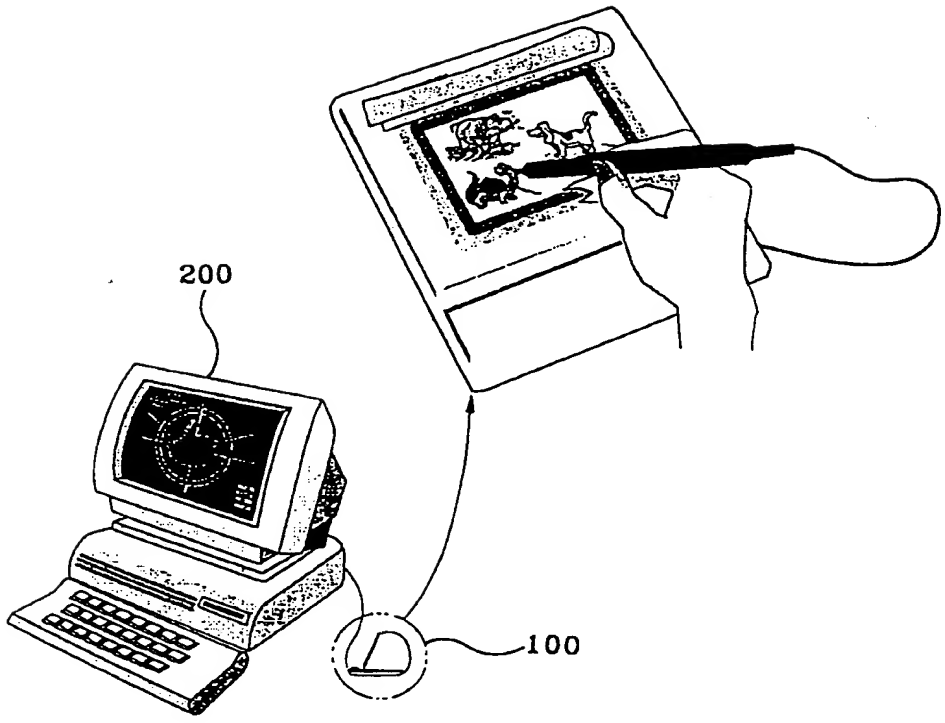


FIG. 8

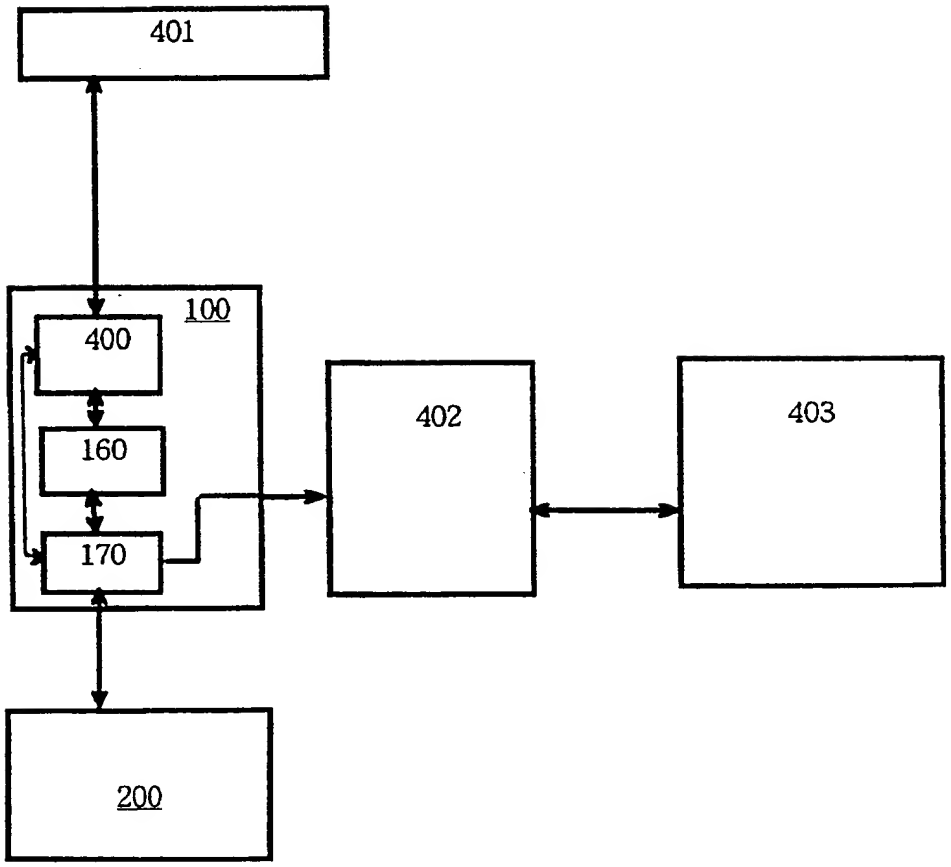


FIG. 9

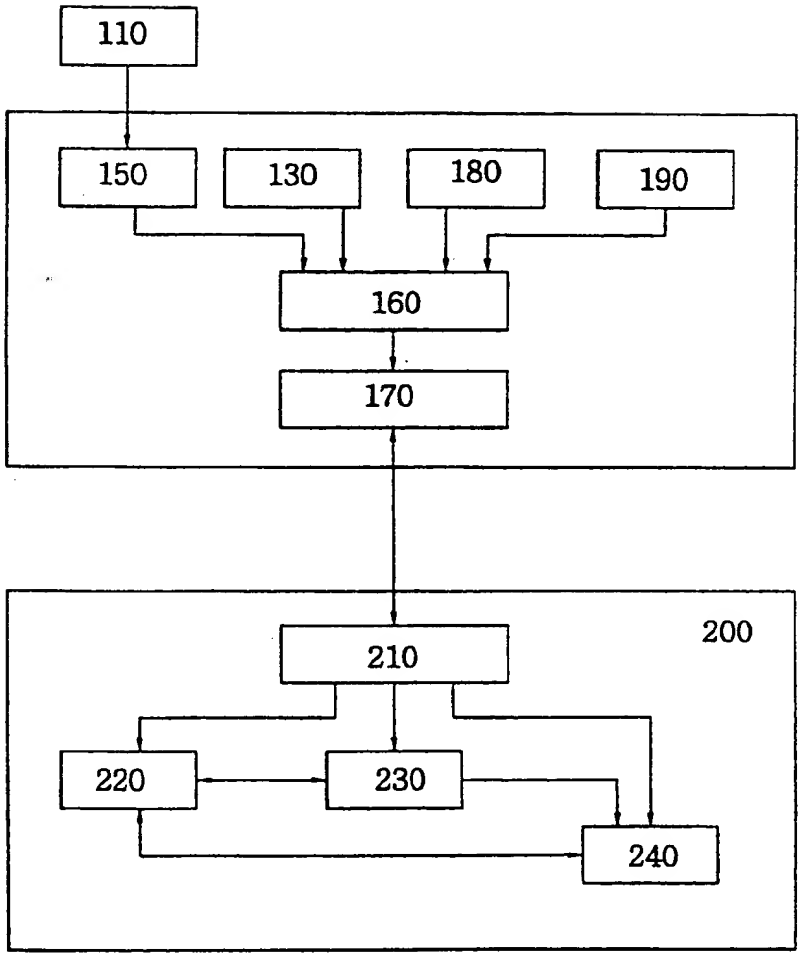


FIG. 10

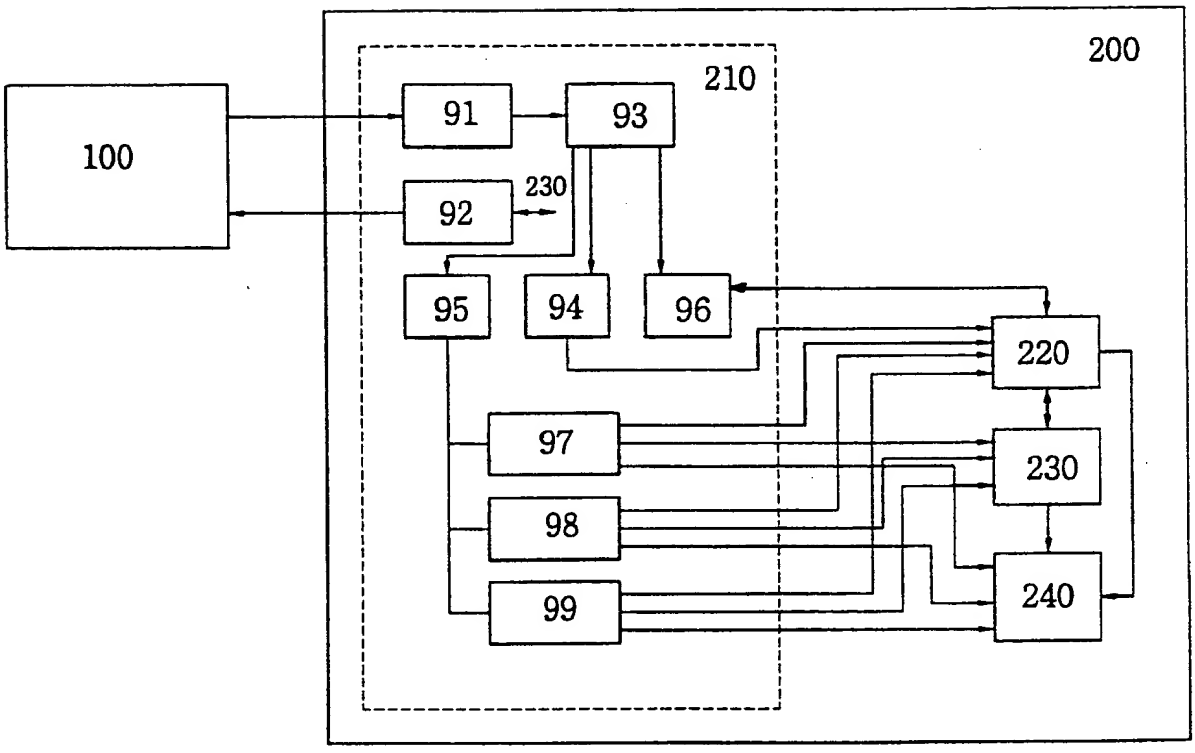
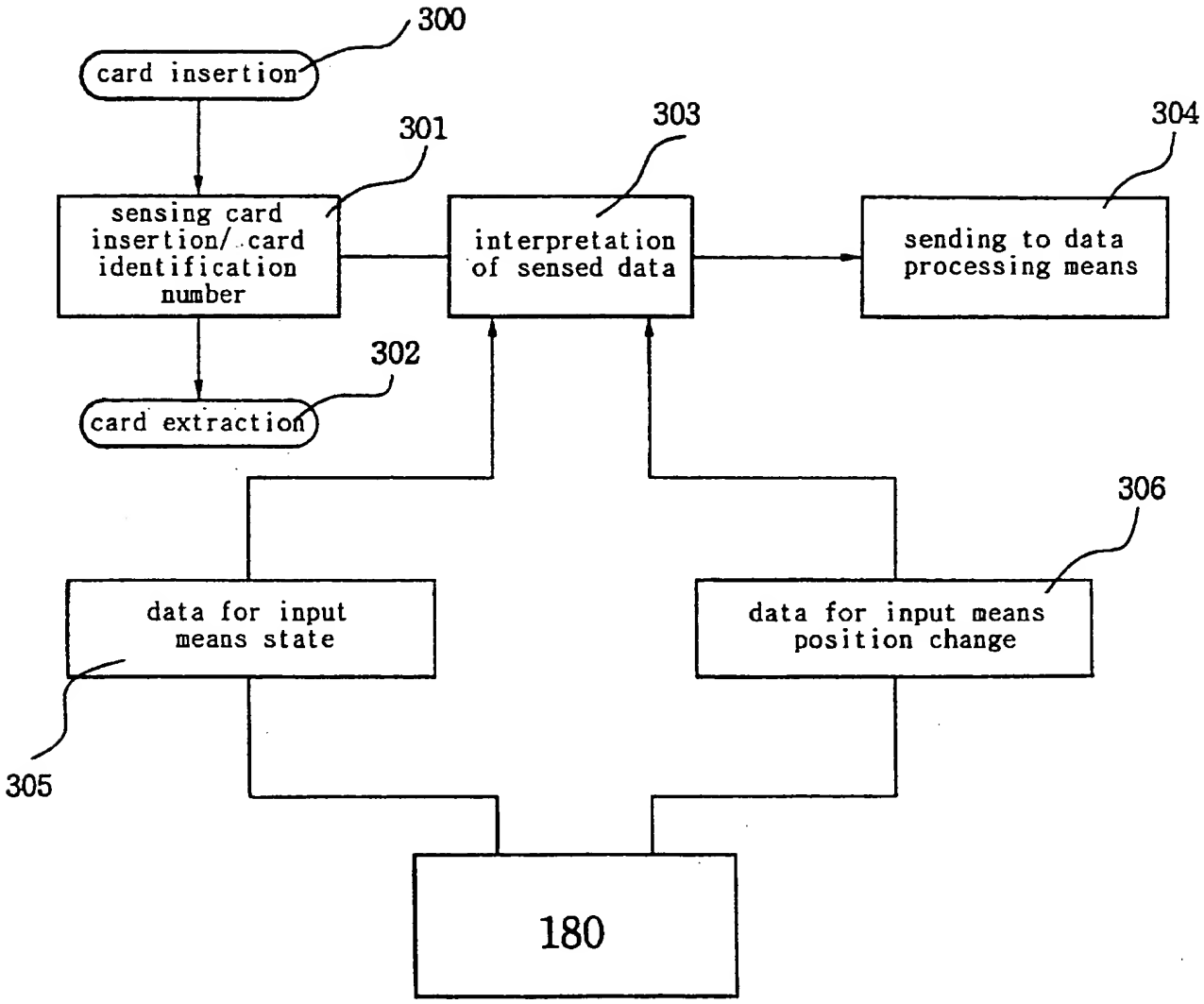


FIG. 11


300
card insertion
301
sensing card insertion/ card identification number
303
interpretation of sensed data
304
sending to data processing means
302
card extraction
306
data for input means state
data for input means position change
305
180

INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR 99/00195

A. CLASSIFICATION OF SUBJECT MATTER

IPC[6]: G 06 F 3/08; G 07 B 17/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC[6]: G 06 F; G 06 K; G 07 B; H 04 M; H 04 N; G 10 H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPI

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0 780 772 A2 (CIRCUS LOGIC), 25 June 1997 (25.06.97), abstract; fig.1.	1,18,27,28,35
A	US 5 602 743 A (FREYTAG), 11 February 1997 (11.02.97), claim 4; fig.1,7.	1,18
A	US 5 452 352 A (TALTON), 19 September 1995 (19.09.95), claim 1; fig.1.	1
P,A	DE 19 757 493 A1 (LG ELECTRONICS), 23 July 1998 (23.07.93), abstract; fig.5a.	1,38,39,40
P,A	EP 0 853 308 A1 (YAMAHA), 15 July 1998 (15.07.98), claims 6-10; fig.1.	1

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:
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„Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
„&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
09 June 1999 (09.06.99)	23 July 1999 (23.07.99)
Name and mailing adress of the ISA/AT Austrian Patent Office Kohlmarkt 8-10; A-1014 Vienna Facsimile No. 1/53424/535	Authorized officer Mihatsek Telephone No. 1/53424/329

Form PCT/ISA/210 (second sheet) (July 1998)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/KR 99/00195

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